THE FIRE-COLORED SUNSET AS A VALUABLE CLUE TO THE EXISTENCE OF A TROPICAL STORM.

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Wireless has made the location of tropical disturbances fairly certain, but some of small diameter may form in a bend in the isobars or be undiscovered by ships. Therefore hurricane observers must watch every sign during the season, and let nothing escape their notice.

There have been several cases of small tropical storms which appeared without warning, no upper clouds moving from an unusual direction, sea swells or even increase in wind.

However there is an important sign that may indicate the existence of a hurricane when nothing else does, the lurid sunset, which often precedes the sea swell and upper clouds by 24 to 48 hours or more.

As is well known a hurricane has a small, violent center, but it affects the atmosphere for a distance of over a thousand miles, as proved by observations of the clouds, pressure and temperature in the different quadrants. It is not unlike the emptying of a washbowl of water, the center having a violent twist, while the currents on the outside slowly revolve in large circles. The air around a hurricane must behave in a similar manner, and thus spread, the dust forms circularly around the center. Approximately twenty minutes after the sun has gone below the horizon the rays that pass through these dust bands are reflected by the clouds as a fire color. This may also happen before sunrise, as observed during September 1920. The fire color does not last very long and its brilliancy seems to depend on the strength of the disturbance. If there are no clouds present this unusual color can not be detected, which may explain why no lurid sunsets were seen before several of the famous hurricanes, the sky either being devoid of clouds, or the observer did not look at the right time.

The fire-colored sunset is quite different from the ordinary colored sunset, being awe-inspiring and apparent to even a layman if he happens to look up at the right time.

This clue is especially valuable in showing the presence of small hurricanes which have not been discovered. Such a warning sunset was observed on different evenings during the period from September 17 to 21 at Wilmington, N. C. Although there was a tropical storm in the Gulf, still the lurid sunsets combined with unusual directions of the cirrus, moving from south and southeast made the observers on duty suspicious of another off the south Atlantic coast.

The cirri during September 17 to 21 were moving at a variable rate from a southerly direction, but they always melted as they came in from the sea, apparently indicating that the disturbance was of such small vertical extent that the outflowing clouds from it could not last long in the slowly descending air of the anticyclone then establishing itself over the south Atlantic States. September 20 and 21 the wind was fresh northeast, rather gusty, a suspicious sign. Before sunrise and sunset on the 21st the fire color was noticed even by people on the street. Unusual cloud formations with the fire color reflected from them on the morning of September 22 gave a premonition of a small but severe storm outside and coming towards the station. The cirrus was from the southeast and the alto-stratus from the east, while other different types of clouds were moving from other directions. There were three different kinds of cirro-cumulus moving at three different heights with the directions and the rate of translation all different. A typical hurricane sky of the mackerel variety presented itself. These warnings proved correct, for between 6 and 7 p. m. the wind reached a velocity of 33 miles an hour as measured by the station anemometer, an estimated rate of 60 miles at the beach where it blew down a house and 90 miles outside as reported by dependable ship captains. It was accompanied by strong squalls and heavy downpours. Shortly after, there was a lull, and the sky became clear, followed by a strong southeast wind and air that felt hot as if from an oven, the temperature being 77° or more all night and the humidity high. The sea ran heavily at the beach and ships outside reported a small, but severe storm. The pressure showed only a slight dip, not enough to give any evidence of the presence of such a disturbance.

Bright-colored sunsets and sunrises occur at any time of year and are due to a variety of causes, such as volcanic dust, approaching circular storms, cold waves, warm waves and have been observed when there seemed to be no explanation, but a typical fire-colored sunrise or sunset during the hurricane season below the 35th parallel of latitude may be an important warning, especially when combined with other signs, such as clouds moving from an unusual direction, increase in suspicious wind directions (northeast, north and east), sea swells and even when there is no particular fall in pressure. It may be the only clue to the dangerous tropical storms of small diameter which form in a bend in the isobars, over the Gulf Stream or are offshoots of larger hurricanes. The observing of the fire color must put any observer on his guard during the season when the beaches are crowded with visitors, because beaches are epescially exposed, there are often no good harbors, and the available means of carrying people to safety are limited. To allow a hurricane to appear unheralded might mean a serious loss of life.